IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Daniel Marian ENE

For: METHOD FOR HANDLING GLOBAL CHALLENGE AUTHENTICATION REGISTRATION, MOBILE SWITCHING CENTER AND MOBILE STATION THEREFOR

BOX APPLICATION
Assistant Commissioner
    for Patents
Washington, D.C. 20231

Sir:

PATENT APPLICATION TRANSMITTAL LETTER

Transmitted herewith for filing, please find the following:

X   Specification, claims and abstract of the above-referenced patent application (total of __27__ pages).

X   _7_ sheet(s) of drawing(s) (_X_ formal / ___informal).

X   Combined Declaration and Power of Attorney.

X   An Assignment of the invention to: <u>Telefonaktiebolaget L M Ericsson</u>

_   _____A verified statement claiming small entity status under 37 CFR 1.9 and 1.27.

X   Other (specify): __X__ Acknowledgement postcard

            __X__ Assignment Recordal Cover Sheet

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MULTIPLE DEPENDENT CLAIM(S) PRESENTED			**$260.**	$ _____
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        X   Any filing fees under 37 CFR 1.16 including fees for presentation of extra claims.

Date: _April 5 2000_

S. Beauchesne
Signature
Sandra Beauchesne
Registration: No. 43,422

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METHOD FOR HANDLING GLOBAL CHALLENGE AUTHENTICATION REGISTRATION, MOBILE SWITCHING CENTER AND MOBILE STATION THEREFOR

5   ## BACKGROUND OF THE INVENTION

Technical Field of the Invention

This invention relates to cellular telecommunications networks,

10   and more particularly to a method for handling global challenge

authentication registration, and to a Mobile Switching Center (MSC)

and a mobile station performing such global challenge authentication

registration handling.

Description of Related Art

Ever since their introduction on the market, mobile stations have changed the way people communicate. Now, it is possible to reach a person almost anywhere, using only one number. The number is no longer linked to a location, but is rather linked to a mobile station that communicates through a radio interface with a cellular network. So wherever the mobile station is located, i.e. within the cellular network coverage, it can originate or receive a call by means of the radio interface. For originating a call through the cellular network, the mobile station has to identify itself by providing its Mobile Identification Number (MIN) and Electronic Serial Number (ESN). The MIN/ESN allows the cellular network to recognize which mobile station is calling, so to charge fees incurred for the call appropriately.

A problem that has emerged with the ever-increasing popularity of mobile stations is the cloning. The cloning is performed by "listening" to the radio interface to find a MIN/ESN, and programming a second mobile station with the same MIN/ESN. By doing so, the fees incurred for calls originated by the second mobile station are charged to the first mobile station. This method of fraud has caused important financial damages to cellular network providers and to owners of mobile stations.

To solve that problem, the security of cellular networks has been improved with authentication procedures to which the mobile stations must participate. One of the various authentication procedures that has

been developed for D-AMPS (Digital-Advanced Mobile Phone Service) is called Global Challenge. This authentication procedure relies on using an algorithm called CAVE, and in an exchange of parameters between the mobile station and an authentication center.

5   The authentication center stores a set of data for each mobile station including their MIN and ESN, along with an A-key and a Shared Secret Data (SSD) also called authentication data. The set of data is used as input parameters to the CAVE algorithm, along with a random number broadcast by the MSC servicing the mobile station, to verify

10   authenticity of the mobile station.

More precisely, the Global Challenge procedure is performed on digital or analog control channel at system access, and involves validation of the authentication data received from the mobile station. System access is performed when the mobile station initiates or

15   receives a call, or when the mobile station makes a periodic registration, typically every 10 minutes when the mobile station is powered on and idle, to inform the cellular network of its location.

However, when the mobile station is powered on, idle, and static for long periods of time, the periodic registration is continued with its

20   repetitive global challenge performance, thus causing important processor load to the MSC. Furthermore, by repetitively performing global challenge at periodic registration while being static and idle, the risks of cloning the mobile station are increased due to the foreseeability of the periodic registration and the lack of movement and

activity of the mobile station.

In order to overcome the disadvantage of existing solutions, it would be advantageous to have a method, which would allow better handling of the global challenge authentication performed in

5   conjunction with the periodic registration. It would also be advantageous to provide a MSC and a mobile station that would support such better handling of the global challenge authentication at periodic registration.

10   **SUMMARY OF THE INVENTION**

The present invention provides a method for handling more efficiently global challenge authentication performed in conjunction with periodic registrations to reduce system load at a Mobile Switching Center (MSC). The present invention also provides a MSC that

15   handles global challenge authentication at periodic registration so as to limit the load incurred on its processors without jeopardizing the existing added security provided by the authentication. Also provided herein is a mobile station (MS) that performs additional verification before repetitively and continuously performing global challenge

20   authentication at periodic registration.

In one aspect, the present invention is a method for handling global challenge authentication registration in a cellular telecommunications network. In this method, a registration message is received at the MSC from a mobile station. The MSC determines

whether it has capabilities for bypassing global challenge authentication. If the MSC has capabilities for bypassing global challenge authentication, the MSC verifies whether a Visitor Location Register (VLR) thereto related has a record for the mobile station from which the registration message has been received. If the VLR has a record for the mobile station from which the registration has been received, the global challenge authentication is bypassed for that mobile station. However, if the VLR does not have a record for the mobile station, the global challenge authentication is performed as usual. In instances where the MSC does not have capabilities for bypassing global challenge authentication, the global challenge authentication is performed for the mobile station.

In another aspect, the present invention is a Mobile Switching Center (MSC) for handling global challenge authentication registration. The MSC has an input port for receiving a registration message from a mobile station, and global challenge authentication logic. The global challenge authentication logic determines whether global challenge authentication is required for the mobile station from which the registration message has been received.

In yet another aspect, the present invention is a mobile station for handling global challenge authentication registration. The mobile station has an input/output module for receiving a broadcast message and for transmitting a periodic registration message. The mobile station also has a global challenge authentication calculation module

for computing an authentication signature. Also incorporated in the mobile station is a discrimination module for determining whether the authentication signature is required for the periodic registration message, so that the authentication signature is computed and included

5   in the periodic registration message when the discrimination module determines that it is required. However, if the discrimination module determines that the authentication signature is not required, than it is not computed and it is not included in the periodic registration.

10   **BRIEF DESCRIPTION OF THE DRAWINGS**

The invention will be better understood and its numerous objects and advantages will become more apparent to those skilled in the art by reference to the following drawings, in conjunction with the accompanying specification, wherein like reference numerals denote

15   like parts, and in which:

FIGURE 1 is a functional block diagram of a method for handling global challenge authentication registration in accordance with the prior art;

FIGURE 2 is a functional block diagram of a method for

20   handling global challenge authentication registration in accordance with a preferred embodiment of the present invention;

FIGURE 3 is a functional block diagram of a method for handling global challenge authentication registration in accordance with another preferred embodiment of the present invention;

FIGURE 4 is a functional block diagram of a method for handling global challenge authentication registration in accordance with another preferred embodiment of the present invention;

FIGURE 5 is a functional block diagram of a step for determining whether to bypass global challenge in accordance with the teachings of the present invention;

FIGURE 6 is a Mobile Switching Center (MSC) for performing global challenge authentication registration handling in accordance with the teachings of the present invention; and

FIGURE 7 is a mobile station for performing global challenge authentication registration handling in accordance with the teachings of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS

The present invention relates to global challenge authentication performed in conjunction with periodic registrations, and to a method and to a system to improve such global challenge authentication. For doing so, the present invention provides an improved method for handling more efficiently the global challenge authentication performed at periodic registration, so as to reduce system load induced on a Mobile Switching Center (MSC). The present invention also provides a MSC that handles global challenge authentication at periodic registration more efficiently so as to limit the load incurred on its processors, without jeopardizing the existing added security

provided by the authentication. Also provided herein is a new mobile station (MS) that performs additional verifications before quite simply repetitively and continuously performing global challenge authentication at periodic registration.

5   Reference is now made to FIGURE 1 wherein there is shown a functional block diagram of a method for handling global challenge authentication registration in accordance with the prior art. In such prior art methods, the MSC 10 broadcast a message 14 on its control channel indicating that global challenge authentication is required at

10   each system access. System access includes the initiation or termination of a call, and the periodic registration performed by the mobile station 12, i.e. typically every 10 minutes when the mobile station is powered so as to inform the cellular network of its location. Before performing periodic registration, the mobile station 12

15   determines whether global challenge is required upon periodic registration (step 16). The global challenge procedure consists of calculating at the mobile station an authentication signature based on its mobile station identification number and electronic serial number, and on a random number received from the MSC 10 and a shared secret

20   data, using an algorithm called CAVE for AMPS and D-AMPS networks. If global challenge is required at system access, the mobile station calculates the authentication signature (also called Authr) (step 18), and sends the authentication signature (step 20) to the MSC 10 upon performing its registration.

The MSC 10 receives the authentication signature, and must verify its accuracy by performing authentication (step 22). For doing so, the MSC requests from a corresponding VLR 24, which can be co-located or not with the MSC 10, the shared secret data for that

5 particular mobile station. The shared secret data is sent to the MSC (step 26), which then performs authentication. If the results of the authentication performed by the MSC are the same as the authentication signature received from the mobile station 12, the MSC informs the VLR (step 27) and updates the location of the mobile

10 station (step 28). The MSC also allows the mobile station 12 to continue its system access (step 30).

However, as can be appreciated by those skilled in the art, the continuous recurrence of the global challenge performance at periodic registration causes an important processor load to the MSC.

15 Furthermore, by repetitively performing global challenge at periodic registration while being static and idle, the risks of cloning the mobile station are increased due to the foreseeability of the periodic registration and the lack of movement and activity of the mobile station.

20 Reference is now made to FIGURE 2, which shows a functional block diagram of a method for handling global challenge authentication registration in accordance with a preferred embodiment of the present invention. In that method, as previously described, the MSC 10 broadcast a message 14 on its control channel indicating that

global challenge authentication is required at each system access. The mobile station 12 receives the message 14. Before performing periodic registration, the mobile station 12 determines whether global challenge is required upon periodic registration (step 16). If global challenge is

5   required at system access, the mobile station calculates the authentication signature (also called Authr) (step 18), and includes the authentication signature in the registration message which is sent to the MSC 10 upon performing its registration (step 20).

The MSC 10 receives the registration message that includes the

10   authentication signature, and determines whether it has capabilities for bypassing global challenge authentication (step 31). If the MSC has capabilities for bypassing global challenge authentication, it then performs a verification with a related Visitor Location Register (VLR), shown as co-located for the sake of clarity but those skilled in

15   the art will readily understand that the VLR could also be a standalone node. The MSC verifies whether the VLR has a record for the mobile station from which the registration message has been received. The MSC 10 may also further verify whether the mobile station from which the registration has been received has previously

20   succeeded authentication. If the VLR has a record for the mobile station, then the global challenge authentication is bypassed for the mobile station, and the MSC updates the location information in step 28 and the periodic registration is continued at step 30. However, if the VLR does not have a record for the mobile station, the global

challenge authentication is performed at step 22, in a manner known in the art. Alternatively, if it is determined at step 31 that the MSC 10 does not have capabilities for bypassing global challenge authentication, the global challenge authentication is performed at step 22.

For performing the global challenge authentication at step 22, the MSC 10 requests from the VLR the shared secret data for that particular mobile station at step 24. If the results of the authentication performed by the MSC are the same as the authentication signature received from the mobile station 12, the MSC informs the VLR (step 27) that the MSC has received a registration for the mobile station (step 28), thus resetting a timer therein. Then, the MSC allows the mobile station 12 to continue its periodic registration (step 30).

Referring now to FIGURE 3, there is shown a functional block diagram of another preferred embodiment of the method for handling global challenge authentication of the present invention. In that embodiment, the MSC 10 broadcast the message 14 on its control channel indicating that global challenge authentication is required at system access, but with an indication to the effect that global challenge authentication is not required if the system access is a periodic registration.

The mobile station 12 receives the message 14. Before performing periodic registration, the mobile station 12 determines whether the message 14 received from the MSC indicates whether

global challenge is required upon system access (step 16). If global challenge is required for system access, the mobile station 12 verifies (step 40) whether the message received included an indication that global challenge authentication is not required for periodic registration.

If it is determined in step 40 that global challenge authentication is required for periodic registration, the method moves to step 18, where the mobile station 12 performs global challenge authentication calculation to obtain the authentication signature and includes the authentication signature in the registration message (step 20). In the alternative, if it has been determined in step 40 that global challenge authentication is not required for periodic registration, the registration message is sent (step 42) without including the authentication signature.

As previously described for Figure 2, the MSC 10 receives the registration message, and determines whether it has capabilities for bypassing global challenge authentication (step 31). Reference is now additionally made to Figure 5, where there is shown a more detailed functional block diagram of step 31, for determining whether to bypass global challenge in accordance with the present invention. More particularly, to determine whether the MSC has capabilities for bypassing global challenge, verification is made to determine whether the bypass global challenge feature is active in step 60. If the bypass global challenge feature is not active, it is determined that the MSC does not have capabilities for bypassing global challenge at step 61.

Alternatively, if the bypass global challenge feature is active, a verification (step 62) is made to determine whether the indication (shown as NOPerGC) is sent on the control channel. For instances where the indication that global challenge authentication is not required for periodic registration has been sent on the control channel, it is determined that the MSC has capabilities for bypassing global challenge at step 64. Alternatively, when the indication that global challenge authentication is not required for periodic registration has not been send on the control channel, a verification (step 76) is made to determine whether statistical global challenge for periodic registrations are required. If statistical global challenge for periodic registrations are required, it is determined that the MSC does not have capabilities for bypassing global challenge for periodic registration at step 61, alternatively it is determined that the MSC has capabilities for bypassing global challenge for periodic registration at step 64.

If it is determined in step 31 that the MSC has capabilities for bypassing global challenge authentication, it then verifies with the related VLR, as previously described, that the VLR has a record for the mobile station from which the registration message has been received. If the VLR has a record for the mobile station, then the global challenge authentication is bypassed for the mobile station, and the MSC updates the location information in step 28 and the periodic registration is continued at step 30. However, if the VLR does not have a record for the mobile station, the global challenge

authentication is performed at step 22, in a manner known in the art. Alternatively, if it is determined at step 31 that the MSC 10 does not have capabilities for bypassing global challenge authentication, the global challenge authentication is performed at step 22.

5   For performing the global challenge authentication at step 22, the MSC 10 requests from the VLR the shared secret data for that particular mobile station at step 24. If the results of the authentication performed by the MSC are the same as the authentication signature received from the mobile station 12, the MSC informs the VLR (step 10   27) that the MSC has received a registration for the mobile station (step 28), thus resetting a timer therein. Then, the MSC allows the mobile station 12 to continue its periodic registration (step 30).

Referring now to FIGURE 4, there is shown a functional block diagram of a method for handling global challenge 15   authentication registration in accordance with another preferred embodiment of the present invention.   In this other preferred embodiment, as previously described with respect to FIGURES 2 and 3, the MSC 10 broadcast the message 14 on its control channel indicating that global challenge authentication is required at system 20   access.   The mobile station 12 receives the message 14.   Before performing periodic registration, the mobile station 12 determines whether the message 14 received from the MSC indicates whether global challenge is required upon system access (step 16). If global challenge is required for system access, the mobile station 12 verifies

(step 44) whether the control channel is the same as when the last global challenge authentication was performed. If the control channel is not the same, the method moves to step 18, where the mobile station 12 performs global challenge authentication calculation to obtain the

5   authentication signature and includes the authentication signature in the registration message (step 20). In the alternative, if it has been determined in step 44 that the control channel is the same, the registration message is sent (step 42) without including the authentication signature. The method then continues as described with

10   respect to FIGURE 3.

Turning now to FIGURE 6, there is shown a Mobile Switching Center (MSC) for performing global challenge authentication registration handling in accordance with the teachings of the present invention. The MSC 10 includes an input port 100 for

15   receiving the registration message from the mobile station, as previously described with respect to FIGURES 2, 3 and 4. The MSC also includes global challenge authentication logic 104 for determining whether global challenge authentication is required for the mobile station from which the registration message has been

20   received. The global challenge authentication logic 104 may consist for example of a process encoded in the MSC. The global challenge authentication logic further has capabilities for verifying that the Visitor Location Register (VLR) relating to the MSC has a record for the mobile station from which the registration message has been

received, and/or that the mobile station from which the registration has been received has previously succeeded authentication.

The global challenge authentication logic consists of an activation module 106 for activating and deactivating the global challenge authentication logic. The global challenge authentication logic also has a periodic registration verification module 108 for tracking whether global challenge authentication is broadcast as required for periodic registration by a broadcasting module 102. The periodic registration verification module 108 has capabilities for initiating random global authentication when the global challenge authentication is broadcast as not required for periodic registration.

The MSC 10 also has a broadcasting module 102 for broadcasting on a control channel that global challenge authentication is required upon access to a cellular telecommunications network to which the MSC belongs. The broadcasting module 102 also has capabilities for broadcasting on the control channel that global challenge authentication is required upon access to a cellular telecommunications network to which the MSC belongs, but that global challenge authentication is not required for periodic registration to the cellular telecommunications network. It will be understood by those skilled in the art that the MSC 10 does not broadcast directly on the control channel, but rather that the MSC sends the broadcast to a base station serving the mobile station. It is than the base station that broadcast on its appropriate control channel

that global challenge authentication is required upon access.

Referring now to FIGURE 7, there is shown a mobile station 12 for performing global challenge authentication registration handling in accordance with the teachings of the present invention.

5 The mobile station 12 includes an input/output module 120 for receiving a broadcast on a control channel and for transmitting a periodic registration message. The input/output module may consist, without being limited thereto, of an antenna to which is connected a radio.

10 The mobile station 12 also includes a global challenge authentication calculation module 122 to compute an authentication signature, based on the mobile station identification number, electronic serial number, a random number received from the MSC, using the CAVE algorithm as previously described.

15 The mobile station 12 also includes a discrimination module 124 for determining whether the authentication signature is required for the periodic registration message. The discrimination module includes a control channel tracker 128 for determining whether the control channel is the same as when a previous periodic registration 20 message was sent by the input/output module 120. The discrimination module 124 also includes a broadcast evaluation module 126 for determining whether the broadcast message received by the input/output module 120 indicates whether an authentication signature is required for periodic registration message. Hence, the

authentication signature is computed and included in the periodic registration message if the discrimination module 124 determines that it is required, and the authentication signature is not computed if the discrimination module 124 determines that it is not required and the

5   authentication signature is not included in the periodic registration message before it is sent by the input/output module 120.

It is thus believed that the operation and construction of the present invention will be apparent from the foregoing description. While the method, MSC and mobile station shown and described have

10   been characterized as being preferred, it will be readily apparent that various changes and modifications could be made therein without departing from the spirit and scope of the invention as defined in the following claims.

WHAT IS CLAIMED IS:

1.   A method for handling global challenge authentication registration in a cellular telecommunications network, the method comprising steps of:

receiving at a Mobile Switching Center (MSC) a registration message from a mobile station;

determining whether the MSC has capabilities for bypassing global challenge authentication;

if the MSC has capabilities for bypassing global challenge authentication, verifying whether a Visitor Location Register (VLR) relating to the MSC has a record for the mobile station from which the registration message has been received and if so bypassing the global challenge authentication for the mobile station, else performing the global challenge authentication; and

if the MSC does not have capabilities for bypassing global challenge authentication, performing the global challenge authentication for the mobile station from which the registration message has been received.

2.   The method for handling global challenge authentication registration of claim 1, wherein the method further comprises a step of:

informing the VLR that the MSC has received the registration message from the mobile station, and resetting a timer therein.

3.   The method for handling global challenge authentication registration of claim 1, wherein the step of verifying whether the VLR relating to the MSC has a record for the mobile station from which the registration message has been received further includes a step of

5   verifying whether the mobile station has previously succeeded authentication.

4.   The method for handling global challenge authentication registration of claim 1, wherein before the step of receiving registration message at the MSC, the method comprises further steps of:

broadcasting by the MSC on a control channel that global

5   challenge authentication is required upon access to the cellular telecommunications network;

receiving by the mobile station the broadcasting of the MSC;

performing global challenge authentication calculation to obtain an authentication signature; and

10   including the authentication signature in the registration message and sending the registration message.

5.   The method for handling global challenge authentication registration of claim 4, further comprising steps of:

after the step of receiving by the mobile station the broadcasting

5   of the MSC, a step of determining whether the control channel is the same as when a previous registration was performed, and if the control

channel is the same, the global challenge authentication calculation is not performed, and the registration is sent without the authentication signature.

6.   The method for handling global challenge authentication registration of claim 1, wherein before the step of receiving a registration message at the MSC, the method comprises further steps

5   of:

broadcasting by the MSC on a control channel that global challenge authentication is required upon access to the cellular telecommunications network, but that global challenge authentication is not required for periodic registration;

10   receiving by the mobile station the broadcasting of the MSC;

determining whether the broadcasting of the MSC indicates whether global challenge authentication is required for period registration;

if global challenge authentication is required for periodic

15   registration, performing global challenge authentication calculation to obtain the authentication signature and including the authentication signature in the registration message; and

if global challenge authentication is not required for periodic registration, sending the registration message without the

20   authentication signature.

7. The method for handling global challenge authentication registration of claim 6, wherein the step of determining whether the MSC has capabilities for bypassing global challenge authentication comprises steps of:

5   determining whether a bypass global challenge feature is active;

if the bypass global challenge feature is not active, the MSC does not have capabilities for bypassing global challenge authentication;

if the bypass global challenge feature is active, verifying whether

10   the MSC has broadcast global challenge authentication is not required for periodic registration, and if the MSC has broadcast that the global challenge authentication is not required for periodic registration, the MSC has capabilities for bypassing global challenge authentication;

if the bypass global challenge feature is active, and the MSC has

15   not broadcast that the global challenge authentication is not required for periodic registration, verifying whether statistical global challenge authentication is to be performed for periodic registration;

if statistical global challenge authentication is to be performed for periodic registration, the MSC does not have capabilities for

20   bypassing global challenge authentication; and

if statistical global challenge authentication is not to be performed for periodic registration, the MSC has capabilities for bypassing global challenge authentication.

8.   A Mobile Switching Center (MSC) for handling global challenge authentication registration, the MSC comprising:

an input port for receiving a registration message from a mobile

5   station; and

a global challenge authentication logic for determining whether global challenge authentication is required for the mobile station from which the registration message has been received.

9.   The MSC of claim 8, wherein the global challenge authentication logic is capable of verifying that a Visitor Location Register (VLR) relating to the MSC has a record for the mobile station from which the registration message has been received.

10.   The MSC of claim 9, wherein the global challenge authentication logic is further capable of verifying whether the mobile station from which the registration has been received has previously succeeded authentication.

11.   The MSC of claim 8, further comprising a broadcasting module for broadcasting on a control channel that global challenge authentication is required upon access to a cellular telecommunications

5   network to which the MSC belongs.

12.   The MSC of claim 8, further comprising a broadcasting

module for broadcasting on a control channel that global challenge authentication is required upon access to a cellular telecommunications

5   network to which the MSC belongs, and that global challenge authentication is not required for periodic registration to the cellular telecommunications network.

13.   The MSC of claim 8, wherein the global challenge authentication logic comprises:

an activation module for activating and deactivating the global

5   challenge authentication logic; and

a periodic registration verification module for tracking whether global challenge authentication is broadcast as required for periodic registration by the broadcasting module,

wherein the periodic registration verification module initiates

10   random global authentication when the global challenge authentication is broadcast as not required for periodic registration.

14.   A mobile station for handling global challenge authentication registration, the mobile station comprising:

an input/output module for receiving a broadcast and for

5   transmitting a periodic registration message;

a global challenge authentication calculation module to compute an authentication signature; and

a discrimination module for determining whether the

authentication signature is required for the periodic registration

10   message,

wherein the authentication signature is computed and included in the periodic registration message if the discrimination module determines that it is required, and the authentication signature is not computed if the discrimination module determines that it is not

15   required and the authentication signature is not included in the periodic registration message before it is sent by the input/output module.

15. The mobile station of claim 14, wherein:

the broadcast is on a control channel; and

the discrimination module comprises:

5   a control channel tracker for determining whether the control channel is the same as when a previous periodic registration message was sent by the input/output module, wherein the authentication signature is not computed and not included in the periodic registration message if the control channel is the same as for

10   the previous periodic registration message.

16. The mobile station of claim 14, wherein the discrimination module comprises:

a broadcast evaluation module for determining whether the

5   broadcast message received by the input/output module indicates whether an authentication signature is required for periodic registration

message, wherein if the authentication signature is required, the authentication signature is computed and included in the periodic registration message, and if the authentication signature is not required, the authentication signature is not computed and not included in the periodic registration message.

ABSTRACT OF THE DISCLOSURE

The present invention relates to a method for handling global challenge authentication registration in a cellular telecommunications network. A Mobile Switching Center (MSC) receives a registration message from a mobile station, and it determines whether it has capabilities for bypassing global challenge authentication. In instances where the MSC has capabilities for bypassing global challenge authentication, it verifies whether a Visitor Location Register (VLR) relating thereto has a record for the mobile station from which the registration message has been received, and if so, it bypasses the global challenge authentication for the mobile station. When the VLR does not have a record for the mobile station from which the registration message has been received, it performs the global challenge authentication. Alternatively, if the MSC does not have capabilities for bypassing global challenge authentication, it performs the global challenge authentication for the mobile station from which the registration message has been received. The invention also relates to a MSC and a mobile station for performing the method.
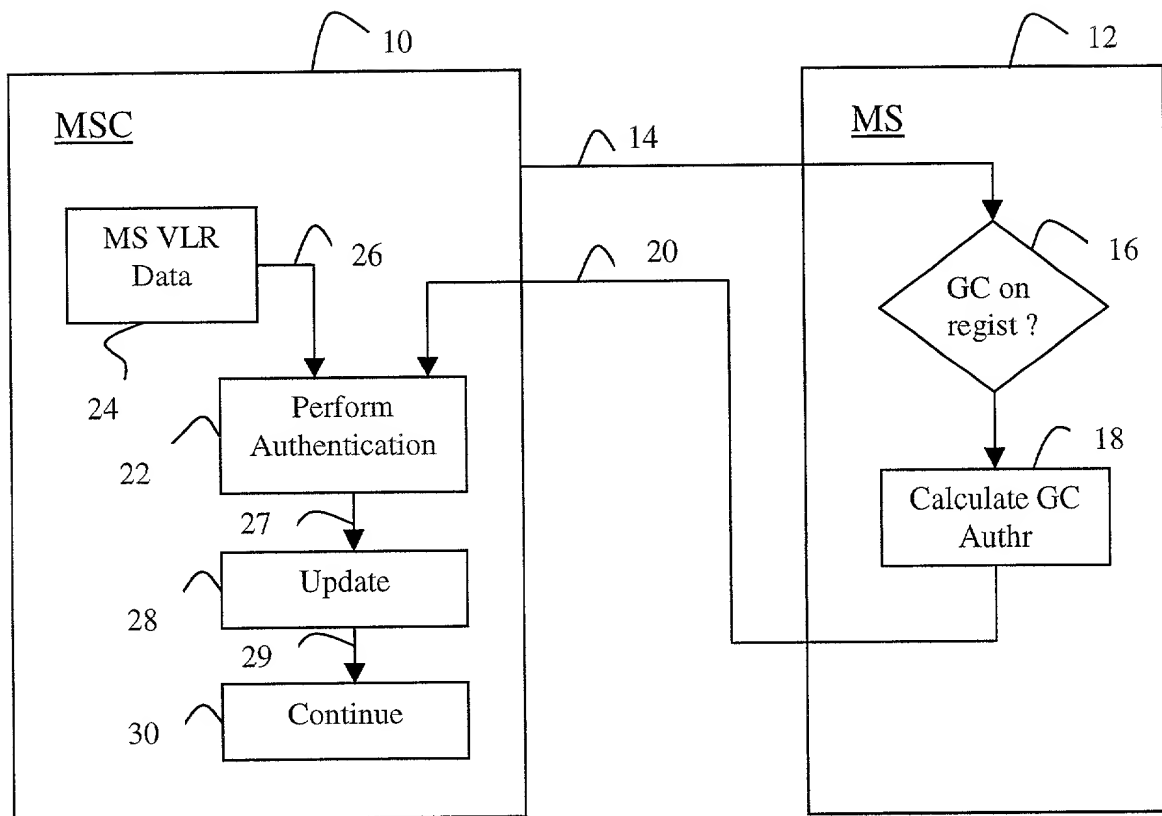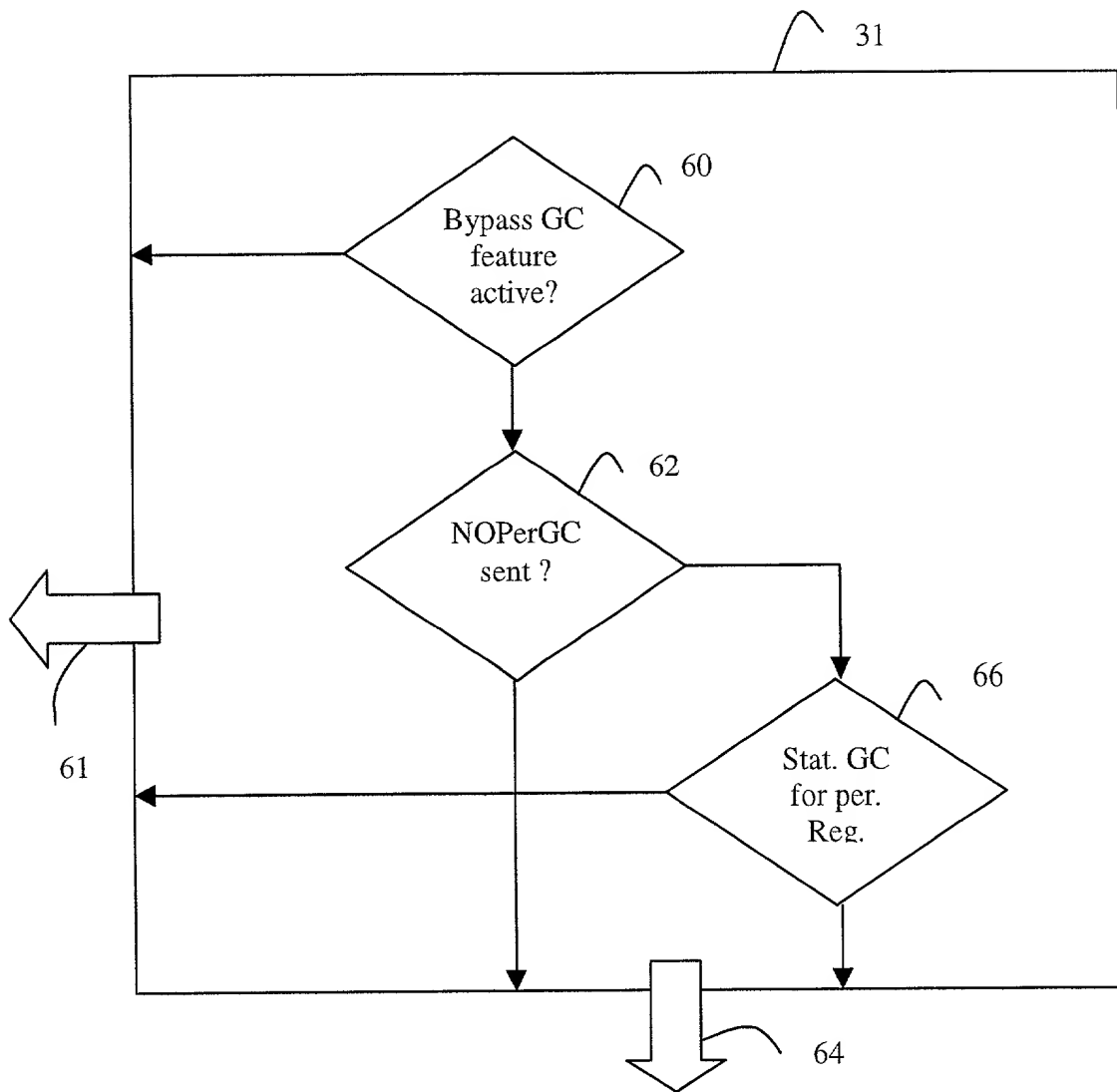
FIGURE 1 (Prior art)
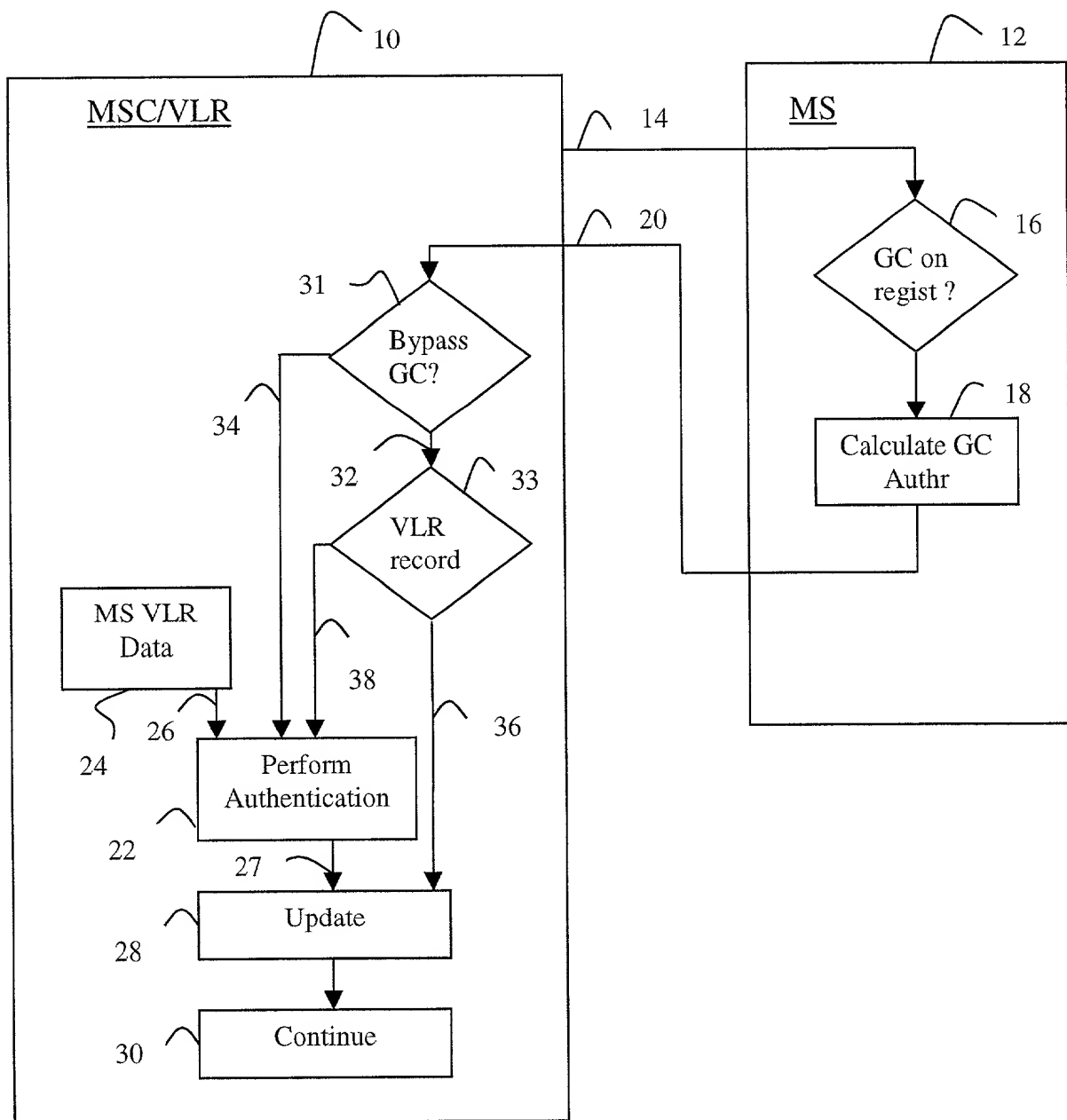
FIGURE 2
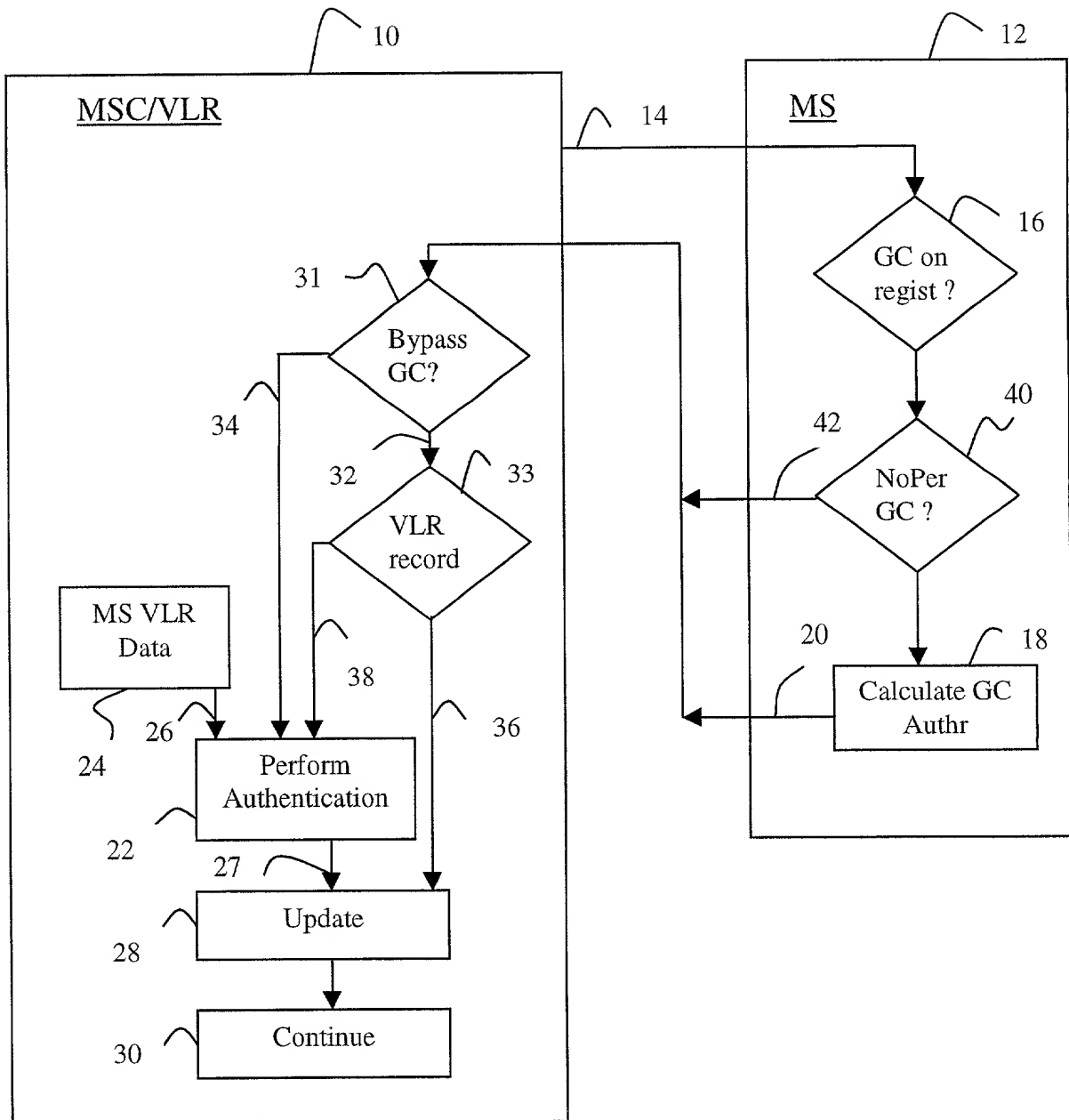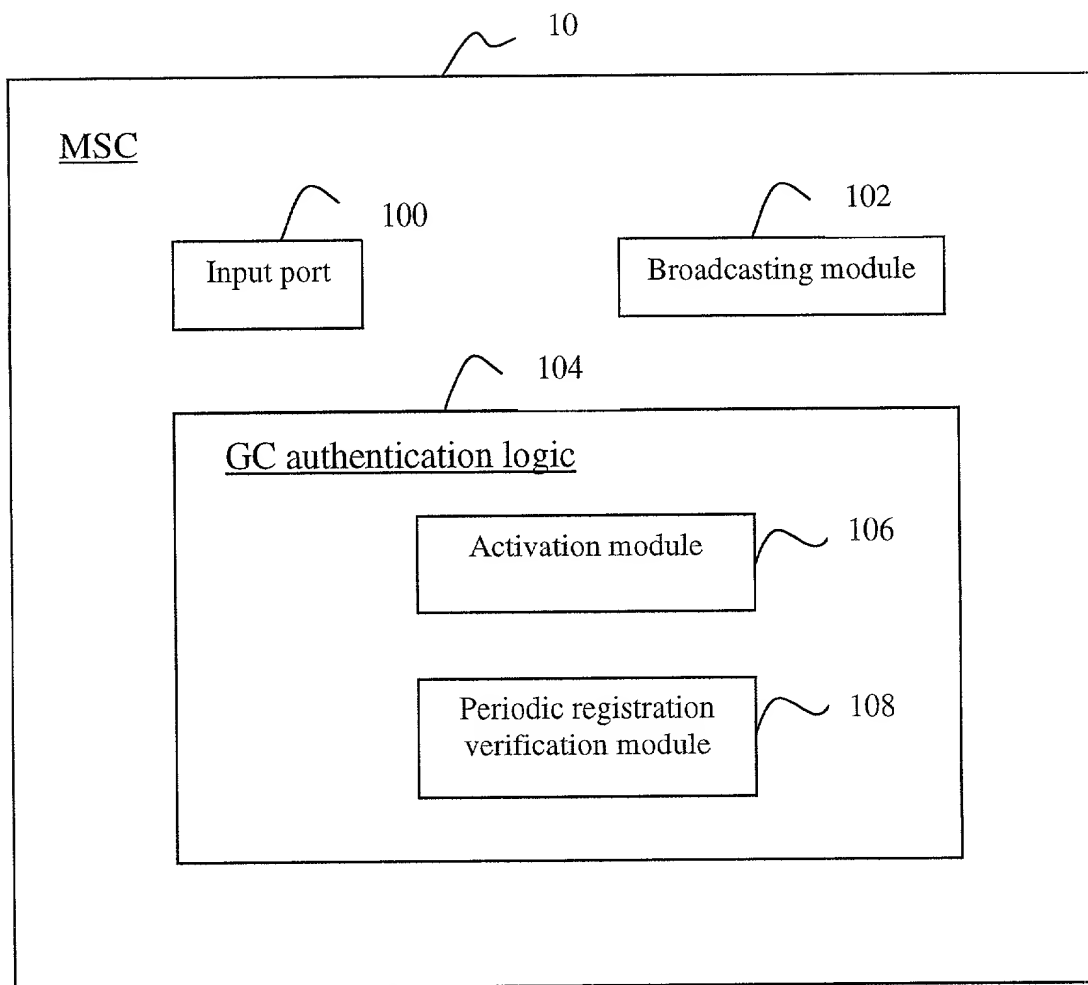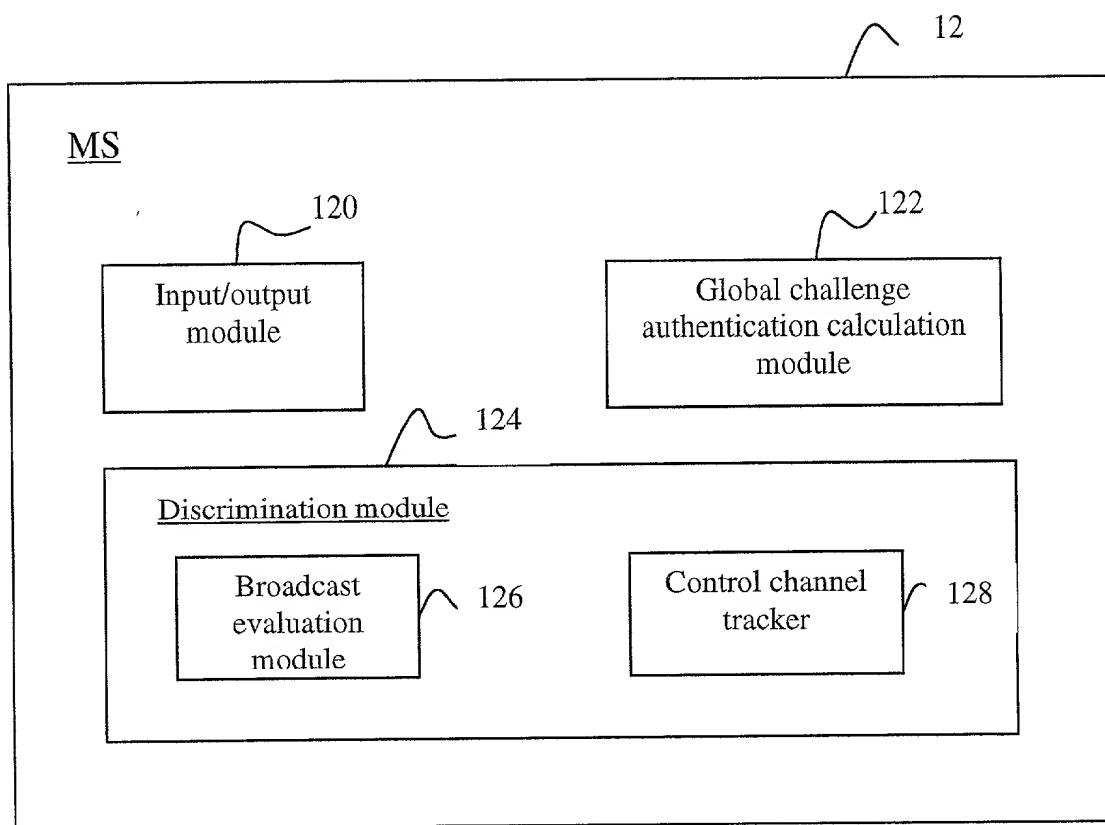
FIGURE 3
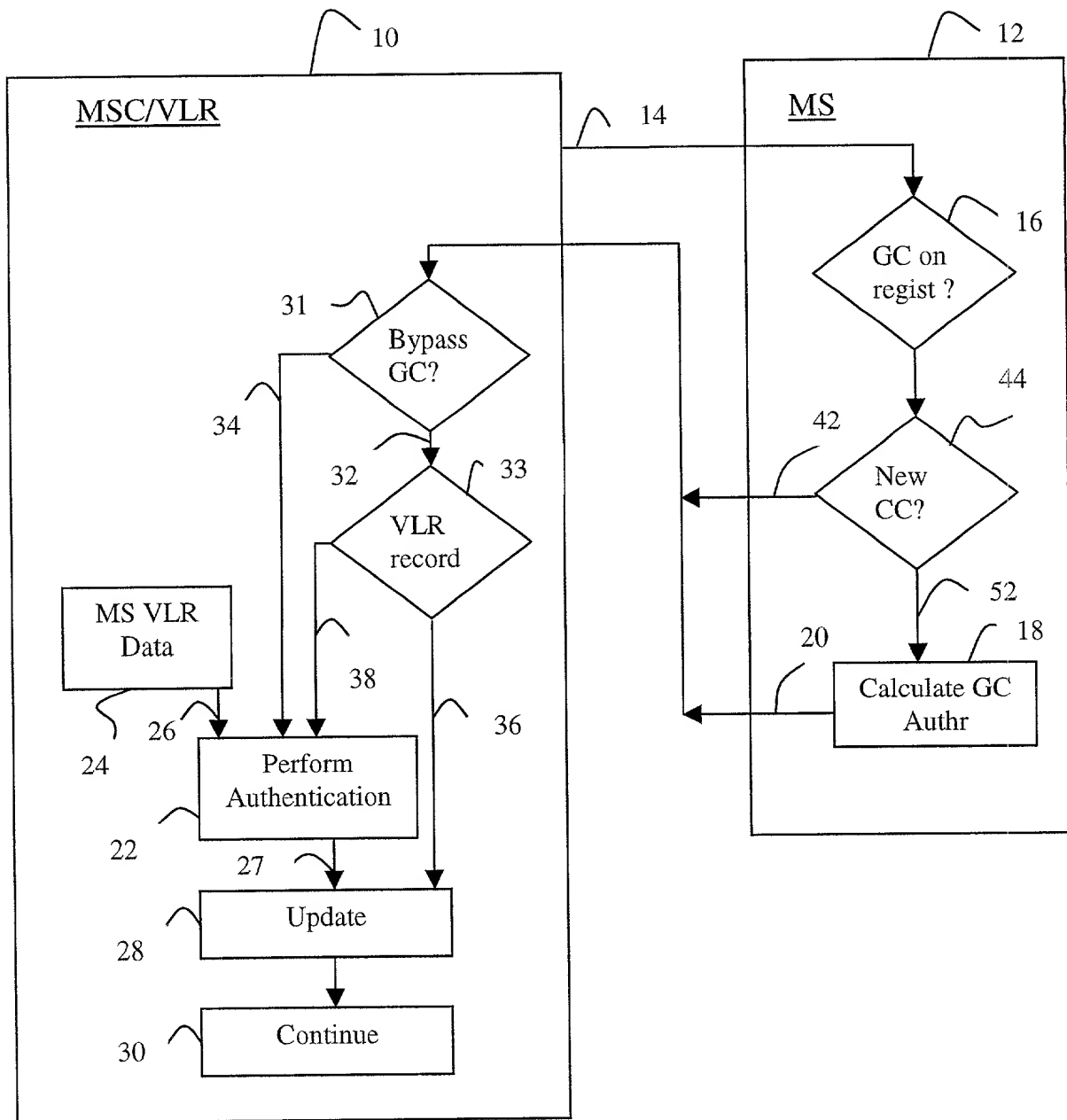
FIGURE 4

FIGURE 5

FIGURE 6

FIGURE 7

RULES 63 AND 67 (37 C.F.R. 1.63 and 1.67)
DECLARATION AND POWER OF ATTORNEY

FOR UTILITY/DESIGN/CIP/PCT NATIONAL APPLICATIONS

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; and

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD FOR HANDLING GLOBAL CHALLENGE AUTHENTICATION REGISTRATION, MOBILE SWITCHING CENTER AND MOBILE STATION THEREFOR

the specification of which: (mark only one)

    X   (a) is attached hereto.
_____ (b) was filed on _____ as Attorney Docket No. 27950-408
         and was amended on _____ (if applicable)
_____ (c) was filed as PCT International Application No. PCT/ _____
         on _____ and was amended on _____ (if applicable)
_____ (d) was filed on _____ as Application Serial No. _____
         and was issued a Notice of Allowance on _____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above or as allowed as indicated above.

I acknowledge the duty to disclose all information known to me to be material to the patentability of this application as defined in 37 CFR § 1.56. If this is a continuation-in-part (CIP) application, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability of the application as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this CIP application.

I hereby claim foreign priority benefits under 35 U.S.C. § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which my priority is claimed or, (2) if no priority is claimed, before the filing date of this application:

PRIOR FOREIGN PATENTS

Number	Country	Month/Day/Year Filed	Date first laid-open or Published	Date patented or Granted	Priority Claimed Yes	No
_____	_____	_____	_____	_____	__	__
_____	_____	_____	_____	_____	__	__

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATIONS

Application No. (series code/serial no.)	Month/Day/Year Filed
_____	_____

I hereby claim the benefit under 35 U.S.C. § 120/365 of any United States application(s) listed below and PCT international applications listed above or below:

PRIOR U.S. OR PCT APPLICATIONS

Application No. (series code/serial no.)	Month/Day/Year Filed	Status (pending, abandoned, patented)
_____	_____	_____

I hereby appoint:

H. MATHEWS GARLAND, Reg. No. 19,129
THOMAS L. CANTRELL, Reg. No. 20,849
THOMAS L. CRISMAN, Reg. No. 24,846
STANLEY R. MOORE, Reg. No. 26,958
GERALD T. WELCH, Reg. No. 30,332
P. WESTON MUSSELMAN, JR., Reg. No. 31,644
SPENCER C. PATTERSON, Reg. No. 43,849

ROGER L. MAXWELL, Reg. No. 31,855
JEFFERY E. BACON, Reg. No. 35,055
ANDRE M. SZUWALSKI, Reg. No. 35,701
J. KEVIN GRAY, Reg. No. 37,141
STEVEN R. GREENFIELD, Reg. No. 38,166
BRIAN D. WALKER, Reg. No. 37,751

all of the firm of **JENKENS & GILCHRIST, P.C.**, 3200 Fountain Place, 1445 Ross Avenue, Dallas, Texas 75202-2799, and

Sandra Beauchesne, Reg. No. 43,422, of Ericsson Canada Inc., 8400 Decarie Blvd., Town of Mount Royal, Quebec, Canada, H4P 2N2

as my attorneys and/or agents, with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith, and to file and prosecute any international patent application filed thereon before any international authorities under the Patent Cooperation Treaty, and I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct them in writing to the contrary.

Please address all correspondence and direct all telephone calls to:

ANDRE M. SZUWALSKI
Jenkens & Gilchrist P.C.
3200 Fountain Place
1445 Ross Avenue
Dallas, Texas 75202-2799
(214) 855-4795
(214) 855-4300 (Fax)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAMED INVENTOR(S)

Full name: _____ Daniel Marian ENE _____

Inventor's signature: _____ [signature] _____ 04-05-2000 ____
(Date)

Residence: __ 405 Westminster, Montreal West, Quebec, CANADA, H4X 1Z9 __

Citizenship: _____ CANADA _____

Post Office Address: 405 Westminster, Montreal West, Quebec, CANADA, ___
H4X 1Z9 _____

(FOR ADDITIONAL INVENTORS, check here ____ and add additional sheet for inventor information regarding signature, name, date, citizenship, residence and address)